

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Schessel

Serial No.: 08/838,209

For: CALL PROCESSING SYSTEM

Filed: April 16, 1997

Group: 2645

Examiner: R. Foster

Att'y Dkt.: 1992P07463US09

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Brian K. Johnson  
Brian K. Johnson  
Reg. No. 46,808

8/28/01  
Date

Preliminary Amendment

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Please amend the above-identified application as follows:

In the Title:

Please replace the title with –FLEXIBLE SOFTWARE ARCHITECTURE FOR A  
CALL PROCESSING SYSTEM—

In the Claims:

Please cancel claims 1-4 and 7-38. Please amend claims 5-6 as set forth below.

A marked-up set of claims appears at the end this preliminary amendment:

5. (Amended) The method of claim 39, wherein at least one requested subroutine program comprises a plurality of additional subroutine programs that are arranged in a predetermined order of activation.

6. (Amended) The method of claim 39, wherein at least one requested subroutine program comprises a plurality of additional subroutine programs that undergo an arbitration for the activation of a respective additional subroutine program prior to the arbitrating step of the method.

Please add new claims 39-76:

39. (New) A method of processing calls in a call processing system comprising:

executing basic call software having a plurality of discrete trigger points, the discrete trigger points being reached during execution of the basic call software;

accessing, at each one of the plurality of discrete trigger points in the basic call software, a database of information regarding each one of the discrete trigger points;

determining, based on the accessed data, a subset of capabilities of a plurality of capabilities permissible at the said one of the plurality of discrete trigger points;

arbitrating among the subset of capabilities to select capabilities; and

performing tasks associated with the selected capabilities.

40. (New) The method of claim 39, wherein the performing comprises suspending the execution of the basic call software and executing subroutine programs in a priority order resulting from the arbitrating.

41. (New) The method of claim 40, wherein the accessing and the arbitrating are performed independently of the subroutine programs performing the tasks associated with the selected capabilities.

42. (New) The method of claim 39, wherein the data stored in the memory is arranged in an administrable format whereby the data is capable of being customized so as to enable the performing to be customized.

43. (New) In a call processing system having a basic call processing program implementing a basic call chain and a plurality of feature programs optionally executed at a plurality of trigger points during execution of the basic call processing program, a memory for storing data relating feature services to the basic call chain, and a feature interaction control program that accesses the memory for storing, a method of implementing at least one feature service for a call connection between subscribers of the call processing system comprising:

- a. executing, at each trigger point, the feature interaction control program;
- b. determining, based upon data in the memory for storing, which feature services are available to be accessed at a respective trigger point during the execution of the basic call program;
- c. blocking certain available feature services from being accessed at the respective trigger point based on feature services that are currently accessed; and
- d. accessing, at the respective trigger point, each respective feature service which is available to be accessed and is not blocked, in a priority order for the feature services established at the most recent formatting of the system.

44. (New) The method of claim 43, wherein the accessing comprises performing, at the respective trigger time, an action by the basic call program that is directed by the stored data pertaining to the respective trigger time and to each

respective feature service which is available to be accessed and is not blocked, said actions being performed in the same priority order as the priority order of the feature services.

45. (New) The method of claim 43, wherein the accessing comprises accessing and executing, at the respective trigger time, each respective feature service that is available to be accessed and is not blocked by feature services that are currently accessed, in the priority order for feature services.

46. (New) The method of claim 43, wherein the accessing comprises:

- i. determining a highest priority ordered feature service that can be accessed at the respective trigger time;
- ii. performing a task by the basic call program that is directed by the stored data pertaining to the respective trigger time and to the highest priority ordered feature service;
- iii. blocking certain feature services, that are available to be accessed and that are not blocked by feature services that are currently accessed, from being accessed at the respective trigger time based on the stored data pertaining to the highest priority ordered feature service; and
- iv. repeating steps i, ii, and iii for the remainder of the feature services, that are available to be accessed at the respective trigger time and that are not blocked as a result of step iii, in succeeding priority order.

47. (New) The method of claim 46, wherein the performing a task

comprises accessing and executing by the basic call program of the highest priority ordered feature service.

48. (Amended) The method of claim 43, wherein each feature service comprises feature call software that governs operations of a particular feature for a call connection between subscribers of the system.

49. (New) The method of claim 43, wherein the determining comprises accessing and operating on data pertaining to each feature service that is provided by the system and is requested by a respective system subscriber, said data being arranged in a customized format.

50. (New) The method of claim 43, wherein the determining comprises accessing and operating on data pertaining to each feature service that is provided by the system and is requested by a respective system subscriber, said data being arranged in a logical table and bit map format.

51. (New) The method of claim 43, further comprising defining at least one trigger point during the execution of the basic call software at which a feature service can be implemented.

52. (New) The method of claim 43, further comprising defining at least one trigger point during the execution of the basic call software at which a respective feature service can be implemented and introducing respective data to the memory.

53. (New) In a call processing system comprising a processor operating both basic call software and feature software, and memory storing data pertaining to the interaction of the basic call software with the feature software, and feature interaction control software, a method of executing feature software comprising:

- a. executing, upon each feature request by the basic call software, the feature interaction control software having a first data operation to determine the respective call features that can be executed; and
  - a second data operation to inhibit certain respective call features from being executed based on call feature software that is currently being executed;
- b. performing a data search of the noninhibited call features to determine the highest priority-ordered call feature; and
- c. executing the call feature software for the respective call feature determined to be a highest priority-ordered, said priority order being established prior to operation of the system.

54. (New) The method of claim 53, further comprising:

- a. executing a third data operation to inhibit certain respective call features from being executed based on the execution of the call feature software for the respective call feature determined to be the highest priority-ordered; and
- b. repeating the steps of executing a third data operation for each remaining call feature that is not inhibited in succeeding priority order.

55. (New) The method of claim 53, wherein the executing the first data

operation comprises determining a first common data set between a data bit map that defines the call features subscribed by the respective subscribers and a data table row that defines the execution of a respective call feature at the feature request.

56. (New) The method of claim 53, wherein the executing the first data operation comprises determining a first common data set between a data bit map that defines the call features subscribed by the respective subscribers and a data table row that defines the execution of a respective call feature at the feature request and determining the entire data set between said common data set and a data bit map that defines the call features that execute other call features upon execution.

57. (New) The method of claim 56, wherein the executing the second data operation comprises determining, for each respective call feature that can be executed, a second common data set between an entire data set that defines all the respective call features that can be executed and a first data table row that defines the blocking of a respective call feature based on call feature software currently being executed.

58. (New) The method of claim 57, wherein the performing a data search comprises performing a bit map search of the second common data set between said entire data set and a blocking data table row.

59. (New) The method of claim 57, wherein the executing the call feature software comprises executing, for the respective highest priority-ordered call

feature, the action defined by a second data table row that defines the execution of a respective call feature at the feature request.

60. (New) The method of claim 54, wherein the executing the third data operation comprises determining, for call feature software newly executed, a third common data set between said entire data set that defines the respective call features that can be executed and a data table row that defines the blocking of a respective call feature based on call feature software newly executed.

61. (New) The method of claim 60, wherein the repeating comprises determining that the third common data set is not a null set.

62. (New) A call processing system, having a processor and a memory, that establishes a call connection between subscribers and implements at least one feature service for the call connection, comprising:

- a. means for establishing a call connection between system subscribers;
- b. means for triggering at least one feature service in a manner

independent of the feature service to be triggered;

c. means for accessing respective feature service data stored in the memory and arranged in an administrable format for use by the means for triggering; and

d. means for directing, upon the triggering of a feature service, the interaction of a respective feature service with the operation of the call connection.

63. (New) The call processing system of claim 62, wherein the means for triggering comprises:



a. means for determining which feature services are available to be implemented at the predefined trigger time during the call connection; and

b. means for implementing each feature service which is determined to be available in a priority order established at a time prior to system operation.

64. (New) The call processing system of claim 62, wherein the means for directing comprises means for executing the feature service during the operation of the call connection.

65. (New) The call processing system of claim 62, wherein the means for directing comprises means for executing a task by the processor as directed by the respective feature service data.

66. (New) A call processing system for telecommunications network that establishes call paths, via transmission lines, between a plurality of subscriber telecommunications terminals, comprising:

a. means for establishing and operating a connection of a call path between respective subscriber terminals;

b. means for providing a feature service for the respective call path;

c. a memory that stores data regarding the network, the system subscribers, and the feature service and arranges the data in a customizable format; and

d. means for triggering the means for providing a feature service to provide certain feature services based on data stored in the memory and for interacting the respective feature service with the call path based on data stored in the memory,

said means for triggering and for interacting being independent of the feature service provided.

67. (New) The call processing system of claim 66, wherein said means for providing a feature service comprises means for providing a feature service for a respective call path from a location remote from the call processing system.

68. (New) The call processing system of claim 66, wherein said means for triggering and for interacting comprises means for arbitrating the order of the respective features in interacting with the call path.

69. (New) A method for triggering features in a call processing system having a processor and a memory, the method comprising:

creating logical tables in the memory having data that establishes a relationship among a plurality of features available in the system and correlating the plurality of features to a plurality of trigger points;

executing feature trigger software at each of the plurality of trigger points, the feature trigger software being independent of each one of the plurality of features being triggered, the feature trigger software accessing the logical tables in the memory to determine a subset of unactivated features of the plurality of features triggerable at the respective trigger point;

activating the triggerable features;

performing tasks associated with the activated features in response to the executing of the feature trigger software.

70. (New) The method of claim 69 further comprising:

assigning a priority to each one of the plurality of features;

activating a feature having a high priority relative to other features;

updating the subset of unactivated triggerable features, if not null, at the respective trigger point in response to the activating of a feature.

71. (New) The method of claim 70 further comprising repeating the activating and updating for a feature having the next highest priority.

72. (New) The method of claim 71 further comprising adding features without modifying the feature trigger software.

73. (New) The method of claim 72 whereby the adding of features comprises adding data to the logical tables.

74. (New) A call processing system having a processor and a memory and having basic call software and feature software for implementing a plurality of features, the feature software being executed at a plurality of trigger points in the basic call software, the call processing system further comprising:

logical tables stored in the memory having data that establishes a relationship among the plurality of features and correlating the plurality of features to the plurality of trigger points;

a feature trigger software routine executed at each of the plurality of trigger points, the feature trigger software accessing the logical tables for determining a subset of the plurality of features that are unactivated and triggerable, the feature trigger software routine controlling execution of the feature software.

75. (New) The system of claim 74 wherein the feature trigger software is independent of the plurality of features being triggered whereby the feature trigger software can accommodate, without modification, an addition features.

76. (New) The system of claim 75 wherein the logical tables comprise:  
a triggered feature blocking table;  
a trigger point table;  
a feature priority list; and  
a subscriber feature bitmap.

### R E M A R K S

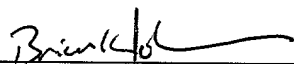
The applicant submits that the pending claims are allowable and it is respectfully requested that the examiner pass the application to allowance.

A version of the claims illustrating the changes is set forth on the following pages.

The examiner is invited to call the undersigned if there are any questions concerning the application.

Dated: August 28, 2001

Respectfully submitted,

  
\_\_\_\_\_  
Brian K. Johnson  
Attorney for Applicant(s)  
Reg. No. 46,808

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(908) 321-3017

### Changes Made to the Claims:

5. (Amended) The method of claim 39 [1], wherein at least one requested subroutine program comprises a plurality of additional subroutine programs that are arranged in a predetermined order of activation.

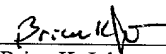
6. (Amended) The method of claim 39 [1], wherein at least one requested subroutine program comprises a plurality of additional subroutine programs that undergo an arbitration for the activation of a respective additional subroutine program prior to the arbitrating step of the method.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Larry E. Schessel Art Unit: 2645  
Serial No.: 08/838,209 Examiner: R. Foster  
Filed: April 26, 1997 Atty Dkt No: 1992P07463US09  
For: CALL PROCESSING SYSTEM

I hereby certify that this paper or fee is being deposited with the United States Postal "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated below addressed to

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Brian K. Johnson  
Reg. No. 46,808

8/28/01  
Date

LETTER TO OFFICIAL DRAFTSMAN


Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Pursuant to M.P.E.P. Section 608.02, enclosed please find fifteen (15) sheets of formal drawings in the referenced case. These are formal versions of the informal drawings filed with the application.

If there are any informalities with these drawings, Applicant requests issuance of a Form PTO-948 identifying the informalities noted by the Official Draftsman.

Respectfully submitted,

  
Brian K. Johnson  
Reg. No. 46,808

Date: August 28, 2001

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FIG. 1

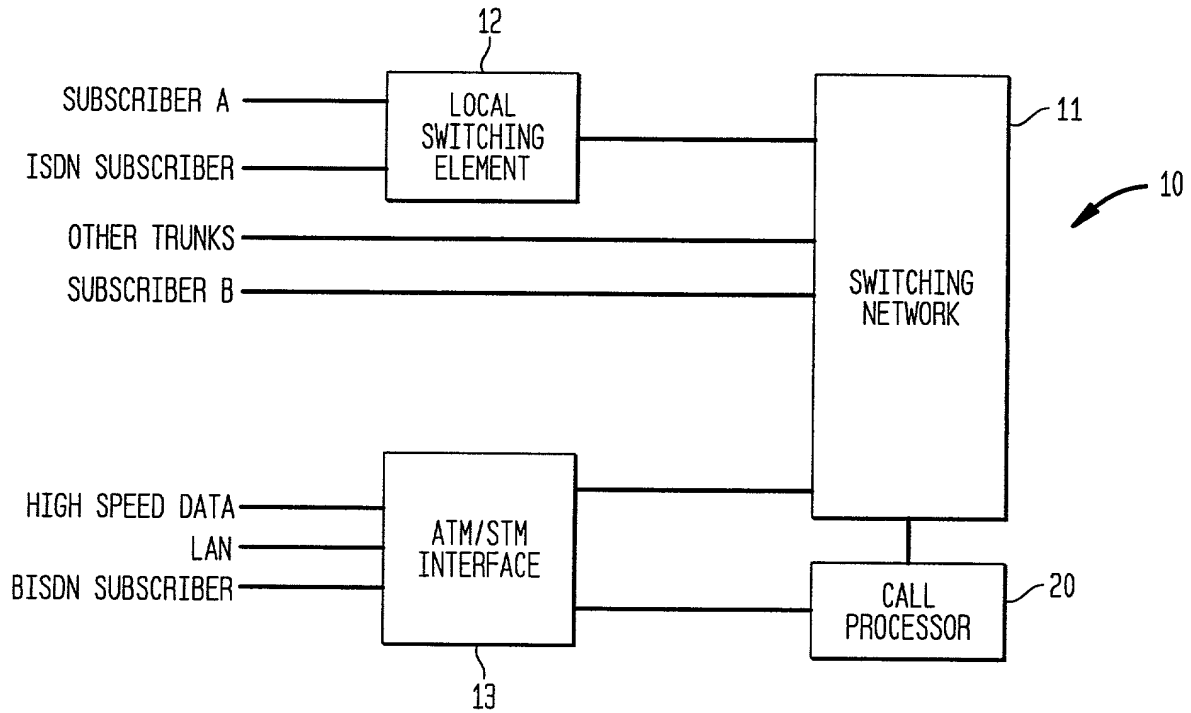


FIG. 2A

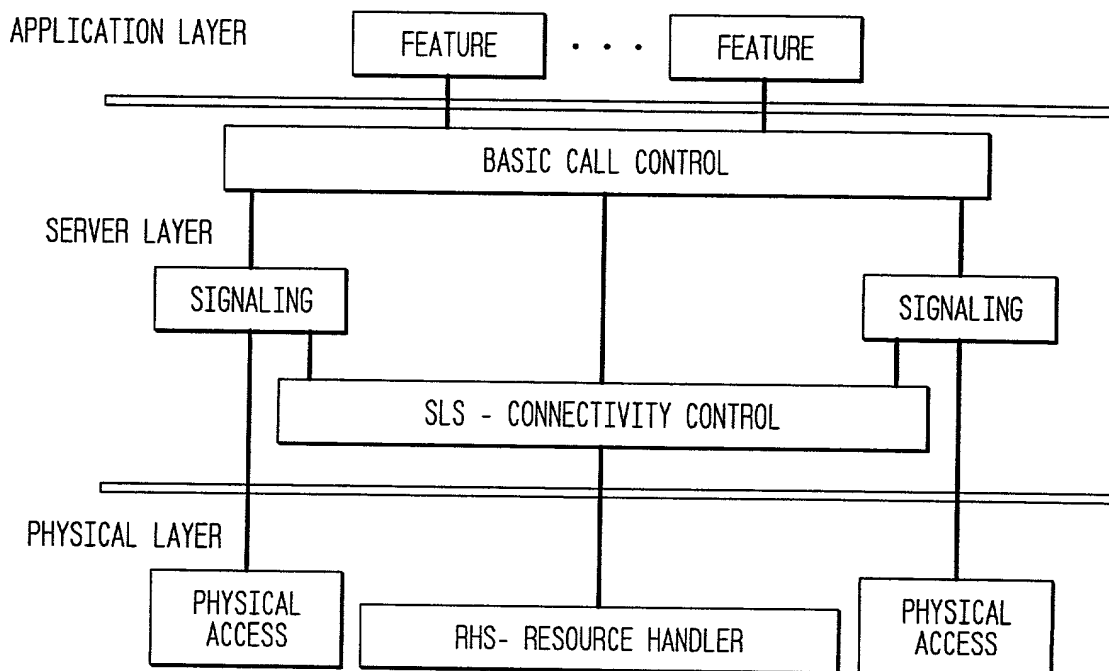




FIG. 2B

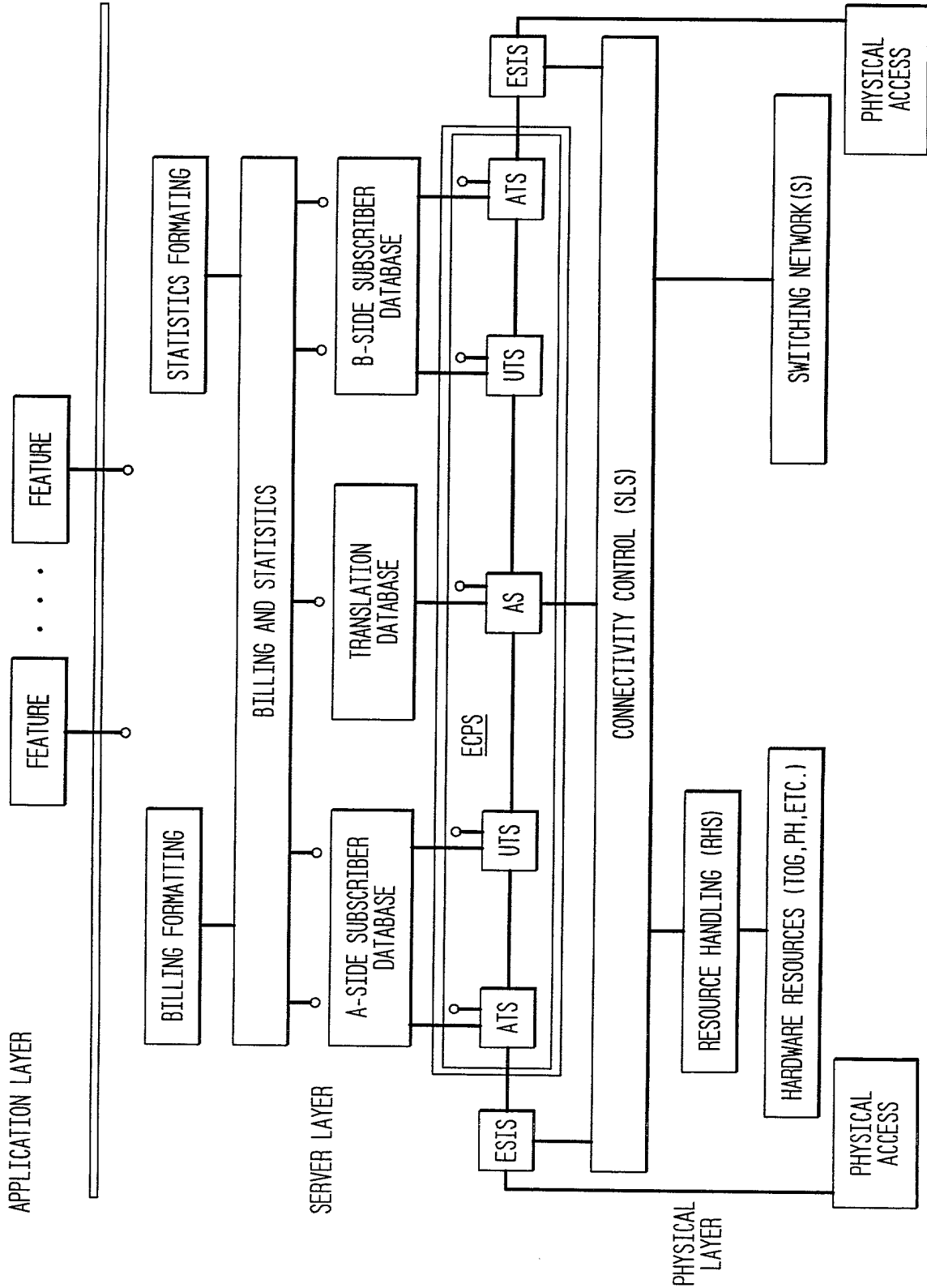


FIG. 2C

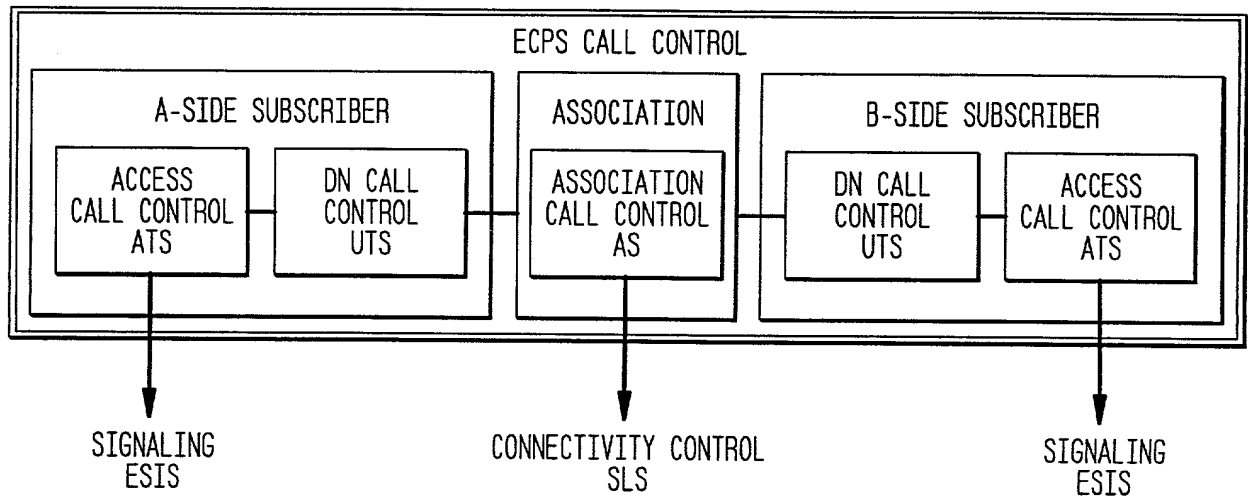


FIG. 3A

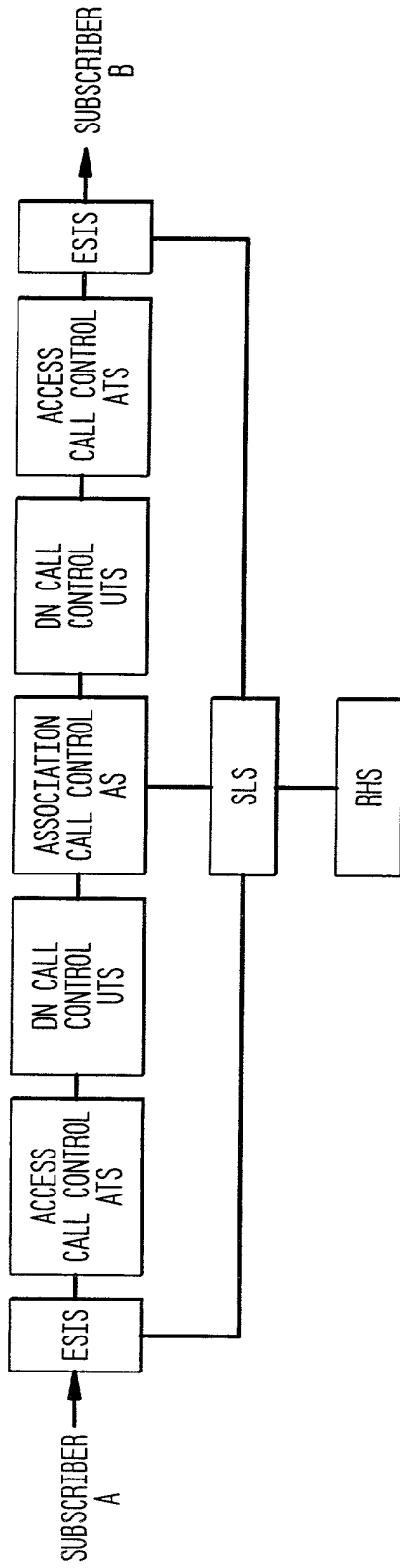


FIG. 3B

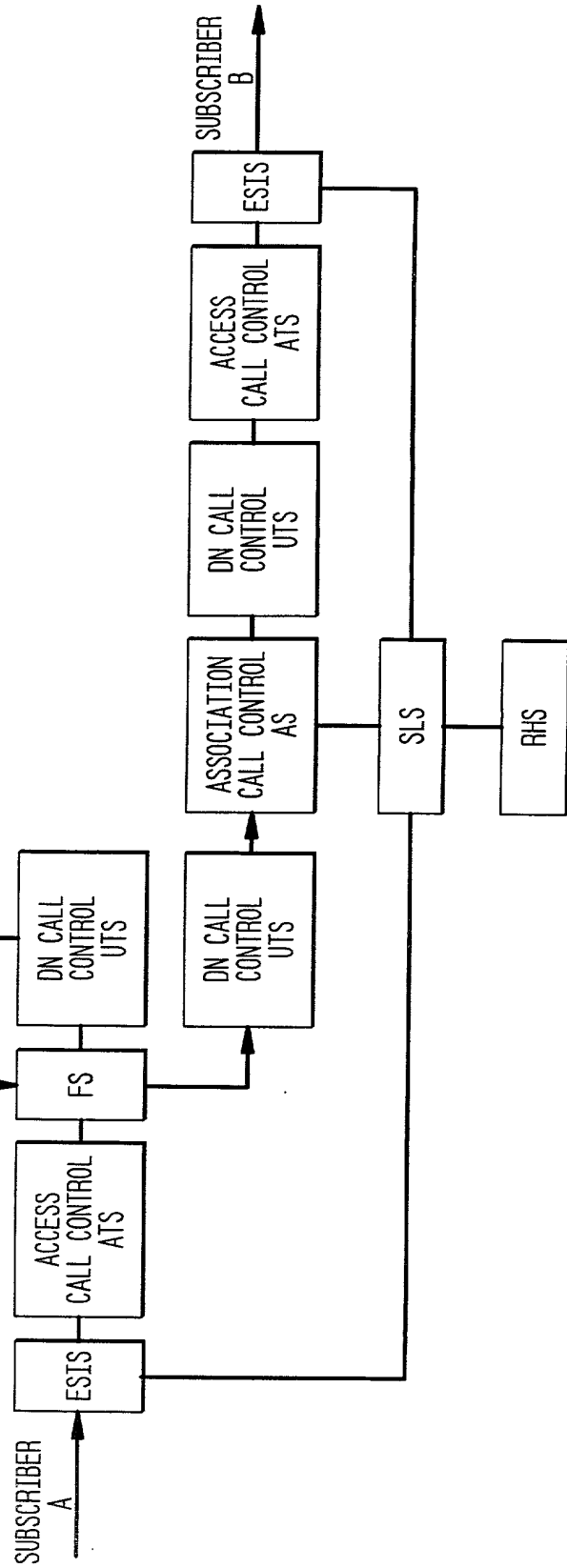
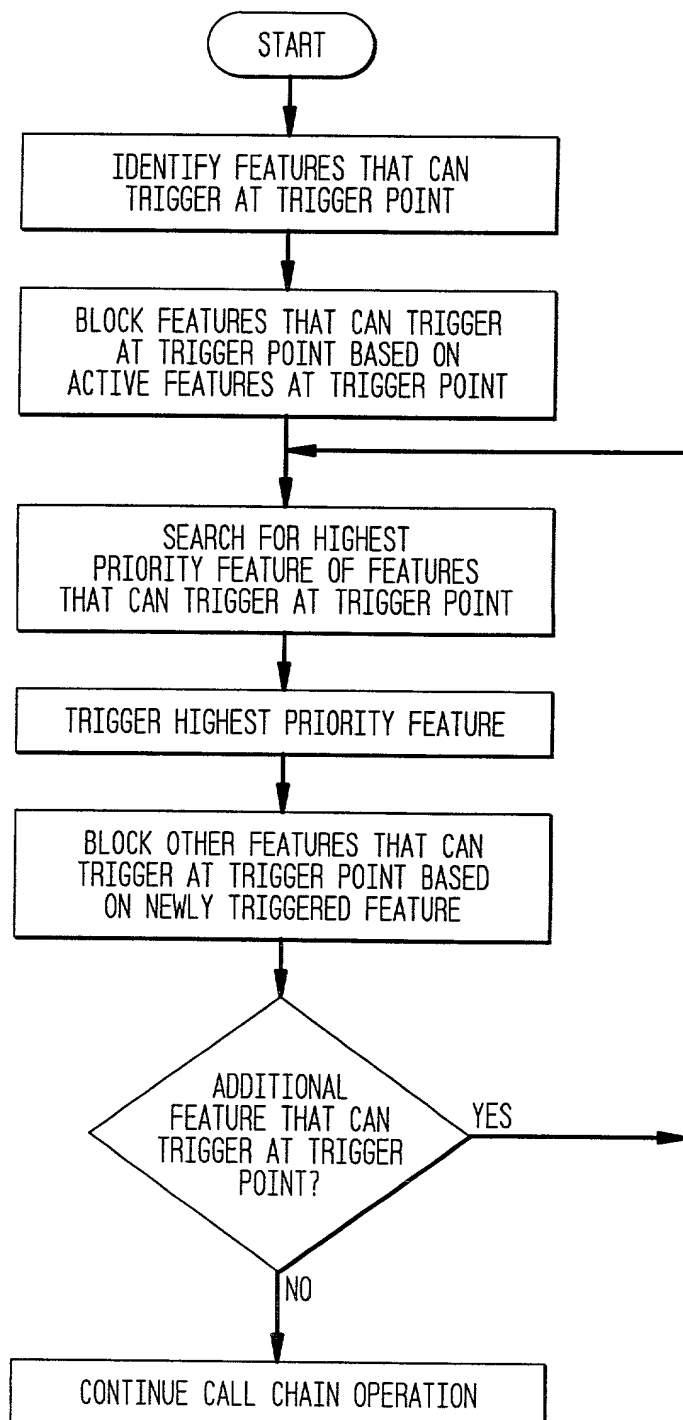


FIG. 4



	F1	F2	F3	F4	F5	.	.	.	Fn
F1	Bit map representing specific feature interaction between F1 and above features (depending on table)								
F2						.	.	.	.
							.		
							.		
Fn						.	.	.	.

	F1	F2	F3	F4	F5	.	.	.	F <sub>n</sub>
T1	Bit map indicating whether above feature (F <sub>x</sub> ) can trigger at this specific Trigger Point (T1)								
	Data per feature indicating action to take if feature above does trigger (i.e. operation)								
T2						.	.	.	.
T <sub>n</sub>						.	.	.	.

F1	F2	F3	F4	F5	.	.	.	Fn
Bit map representing specific features								

FIG. 8A

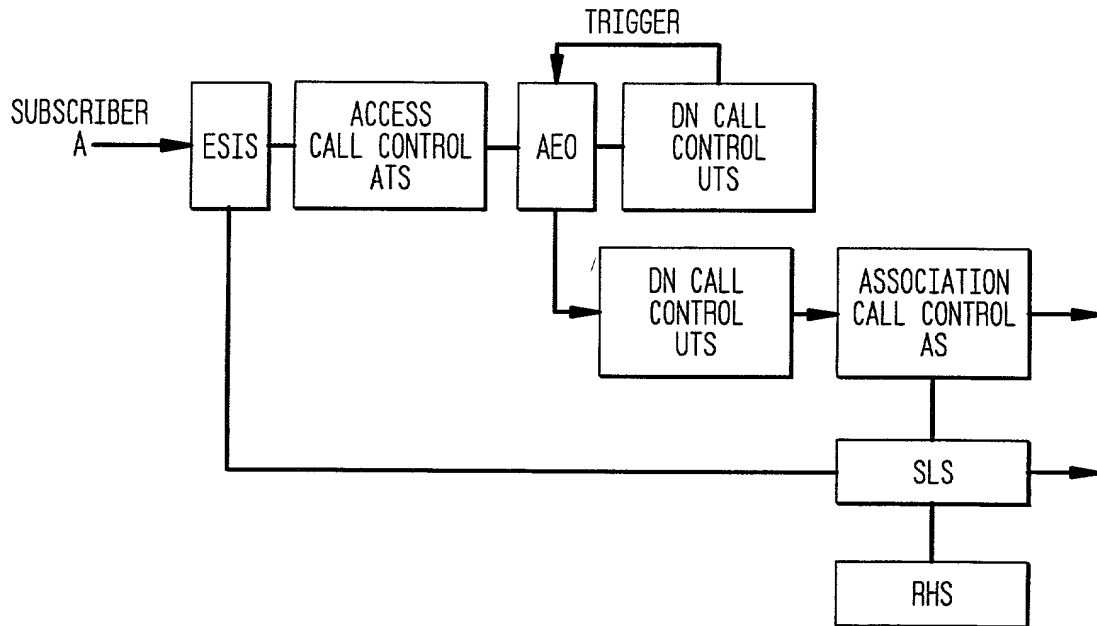
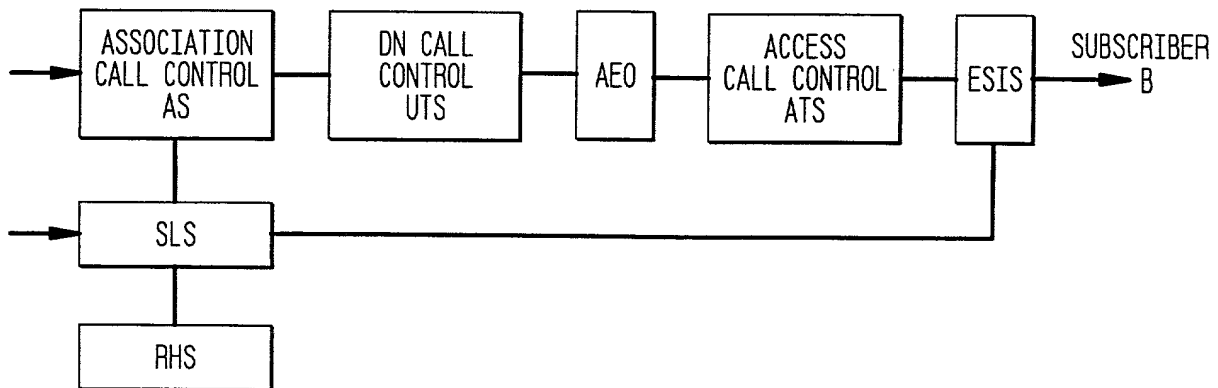


FIG. 8B



**FIG. 8C**

INITIAL CONDITION: A-party is busy with a call and subscribes to DND, CF, and CW. An operator activates AEO and calls the A-party (i.e. AEO has set a persistent trigger condition at the "SUBSCRIBER BUSY" trigger point).

TRIGGER POINT: SUBSCRIBER BUSY (A-party)

STEP (1) Determine features which could trigger at this trigger point based on Trigger Point Table, subscribed features, requested features and persistent features.

SUBSCRIBER BUSY TRIGGER POINT ROW

N	Y	Y	Y
---	---	---	---

AND

SUBSCRIBER FEATURE BITMAP

N	Y	Y	Y
---	---	---	---

OR

PERSISTENT FEATURE BITMAP

Y	N	N	N
---	---	---	---

---

RESULT

Y	N	N	N
---	---	---	---

**FIG. 8D**

STEP (2) Block features based on active features.

The RESULT above remains unchanged since there are no active features on the called line.

**FIG. 8E**

STEP (3a) DO WHILE there are features to trigger

SEARCH (RESULT bit map) = AEO (AEO is most significant bit set to Y)

STEP (3b) Trigger highest priority feature (based on Trigger Point Table lookup)

Based on trigger point table entry for the AEO, feature operation 1 is performed; AEO software is triggered which controls termination to the A-party.

STEP (3c) Block features based on newly triggered feature

OLD RESULT

Y	Y	Y	Y
---	---	---	---

AND

AEO TRIGGERED FEATURE BLOCKING ROW

N	N	N	N
---	---	---	---

---

NEW RESULT

N	N	N	N
---	---	---	---

At this point the NEW RESULT bit map is empty indicating no further feature triggers are required



FIG. 8F

FEATURE PRIORITY LIST (1 being highest priority)	
1	Attendant Emergency Override (AEO)
2	Do Not Disturb (DND)
3	Call Forwarding (CF)
4	Call Waiting (CW)

FIG. 8G

SUBSCRIBER FEATURE BITMAP			
AEO	DND	CF	CW
N	Y	Y	Y

FIG. 8H

TRIGGERED FEATURE BLOCKING TABLE				
	AEO	DND	CF	CW
AEO	N	N	N	N
DND	Y	N	N	N
CF	Y	Y	N	N
CW	Y	Y	Y	N

'N' IMPLIES FEATURE IS BLOCKED

FIG. 8I

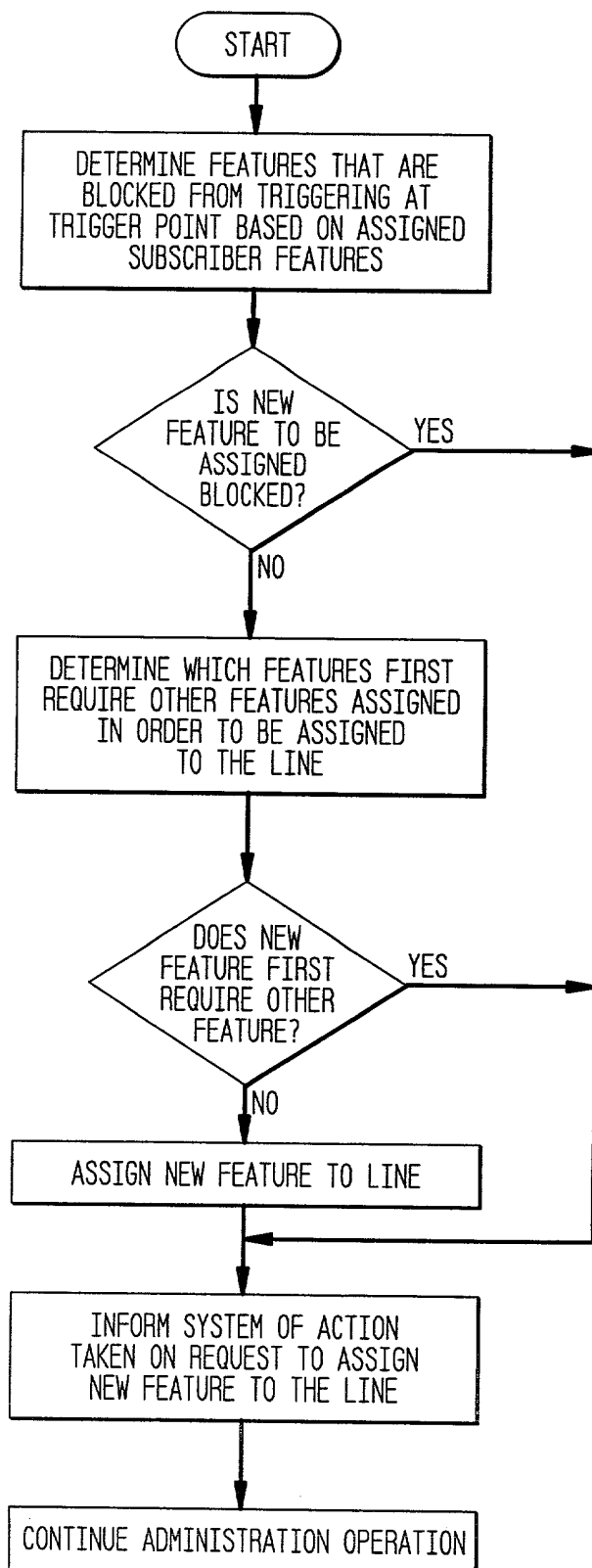
TRIGGER POINT TABLE				
	AEO	DND	CF	CW
	N	Y	Y	Y
TRIGGER PT SUBSCRIBER BUSY	SUPPORTING DATA AEO: action=1 DND: action=1 CF: action=1 CW: action=1			

action 1 = Trigger Related Feature

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FIG. 9



**FIG. 10A**

```

FEATURE PRIORITY          FEATURE
(1 BEING HIGH PRIORITY)

1      MANUAL LINE (HOTLINE)
2      VOICE DATA PROTECTION (VDP)
3      ATTENDANT EMERGENCY OVERRIDE (AEO)
4      DENIED TERMINATION (DT)
5      DO NOT DISTURB (DND)
6      NOT MAKE BUSY KEY (NMBK)
7      CALL FORWARD INHIBIT MAKE BUSY (CFIMB)
8      MAKE BUSY KEY (MBK)
9      CALL FORWARD INHIBIT LINE BUSY (CFILB)
10     DIAL CALL WAITING (DCW)
11     SELECTIVE CALL FORWARD (SCF)
12     CALL FORWARD VARIABLE (CFV)

```

**FIG. 10B**

FEATURES (IN PRIORITY ORDER)

[illegible]

FIG. 10C

FEATURES (IN PRIORITY ORDER)

[illegible]

FIG. 10D

Features (in priority order)

	1	2	3	4	5	6	7	8	9	10	11	12
1 HOTLINE												
2 VDP												
3 AEO												
4 DT												
5 DND												
6 NMBK												
7 CFIMB	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y
8 MBK	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
9 CFILB												
10 DCW												
11 SCF												
12 CFV	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y

FIG. 10E

Feature Possible (initial condition)	=	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
		AND
cfv Admin Blck Tble entry	=	N Y Y N Y Y Y Y Y Y Y Y Y Y Y Y Y Y
RESULT (Feat Possible)	=	N Y Y N Y Y Y Y Y Y Y Y Y Y Y Y Y Y

